
Computing in the RAIN: Reliable Array of Independent Nodes

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Parallel and Distributed Environments

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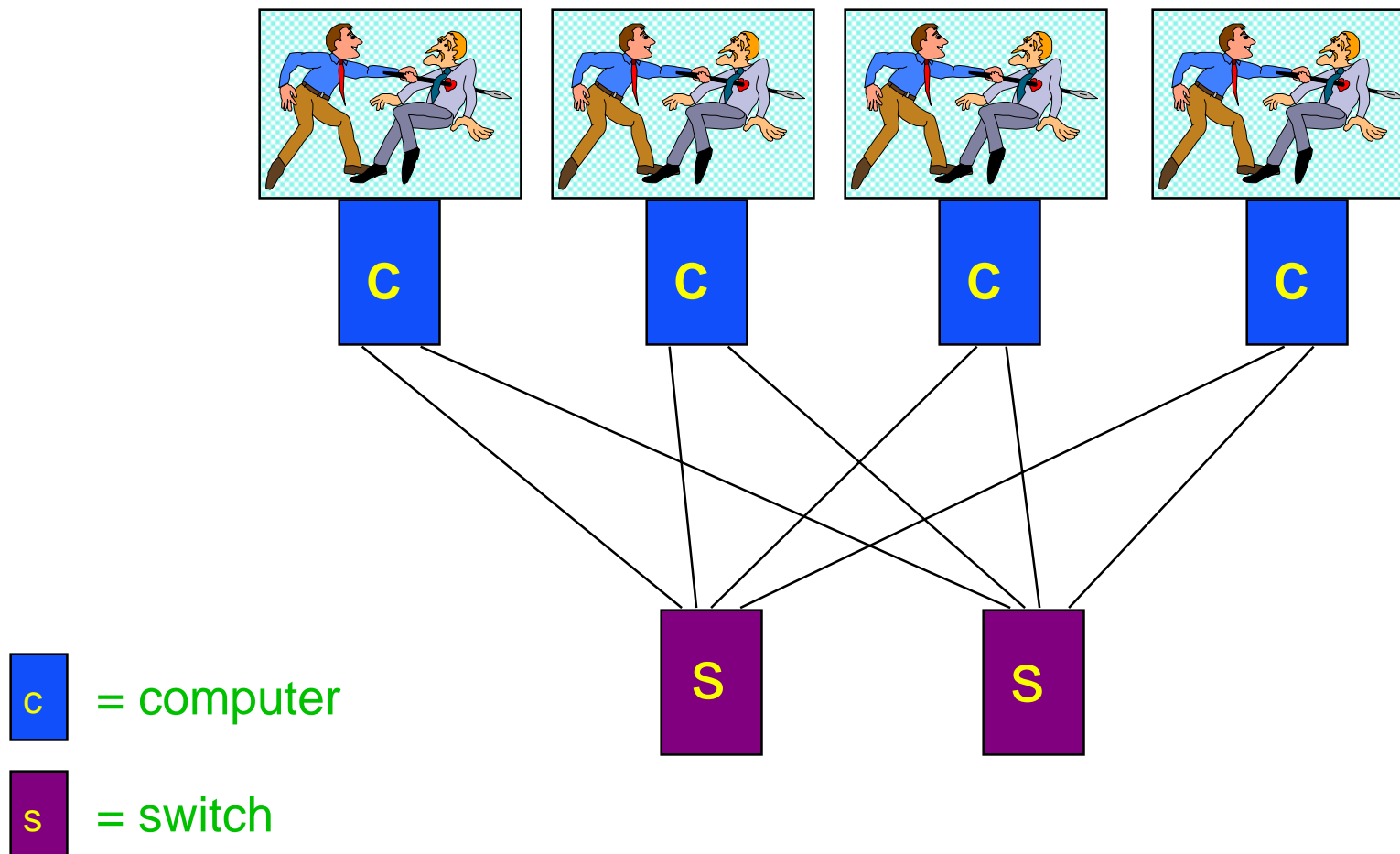
Kevin Foltz

Marc Riedel

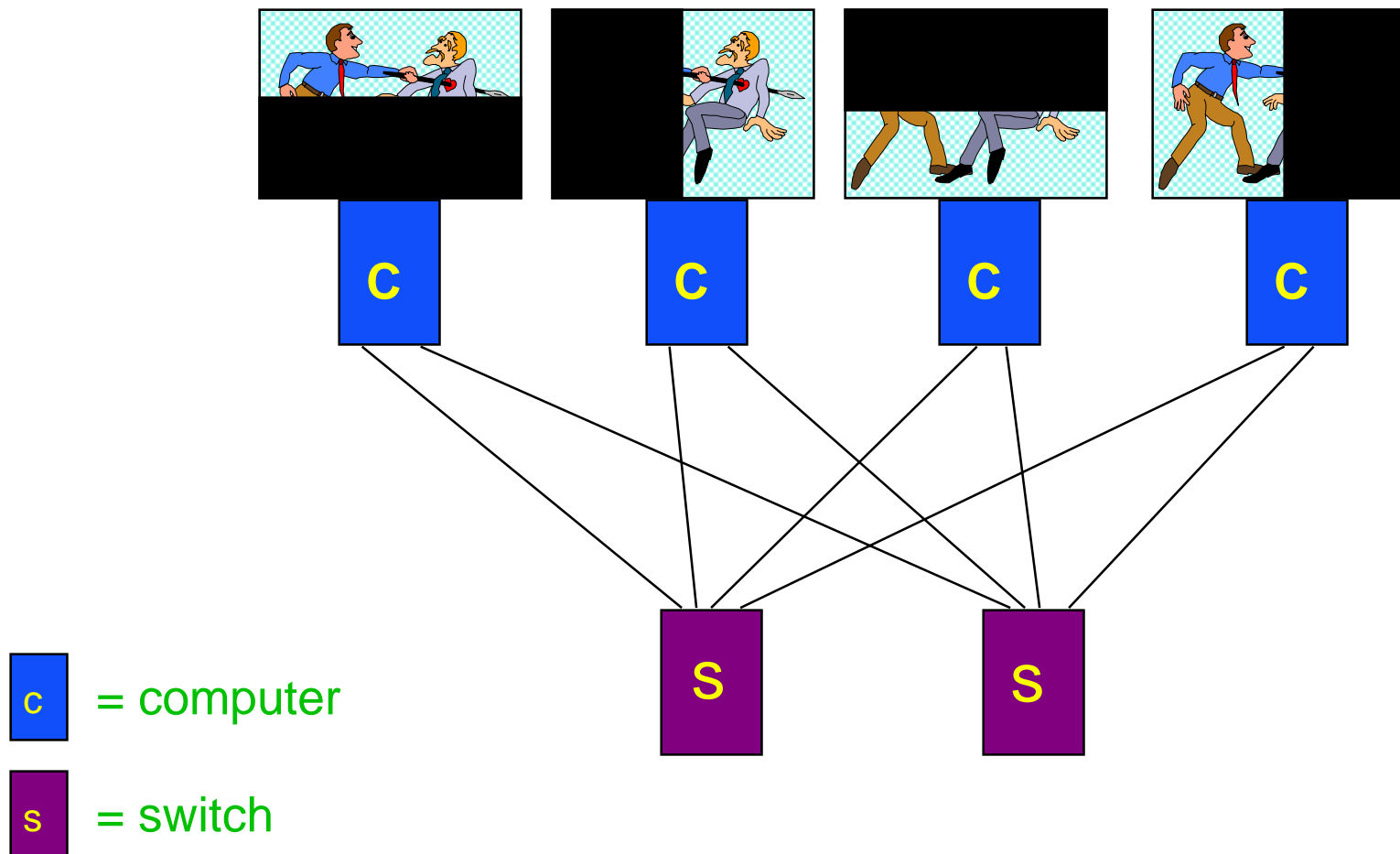
Massimo Franceschetti

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Initial Prototype

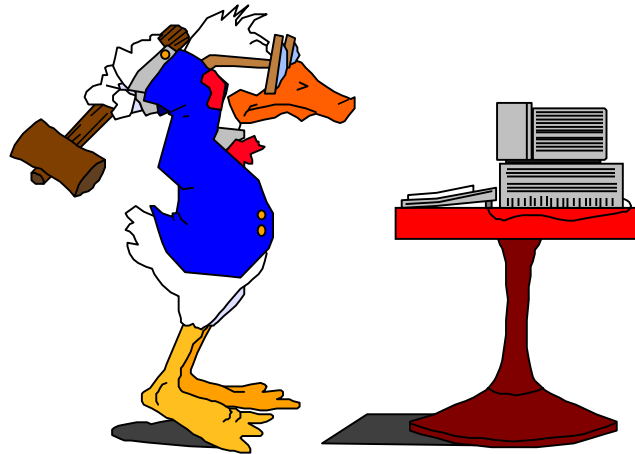


Limited Storage



2 out of 4 Code

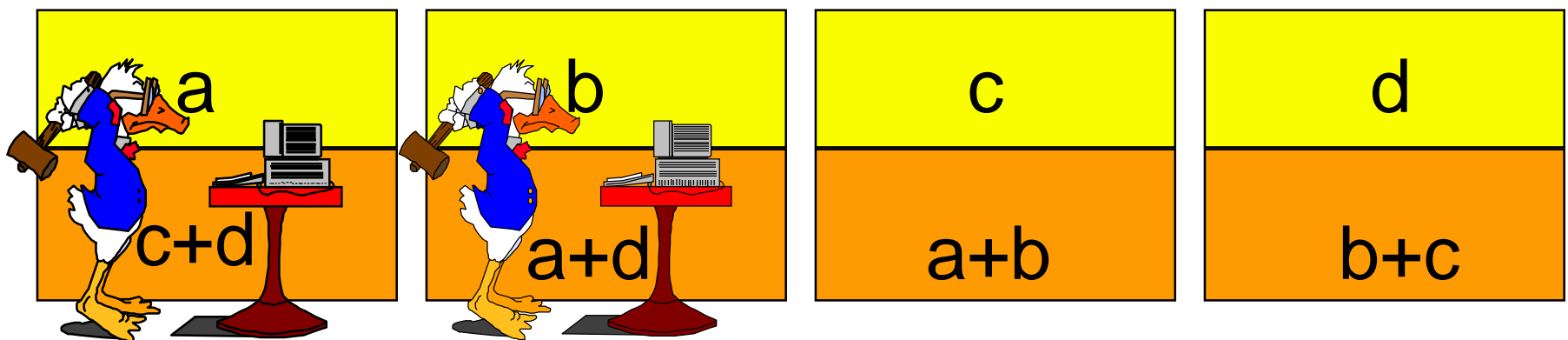
a	b	c	d
c+d	a+d	a+b	b+c



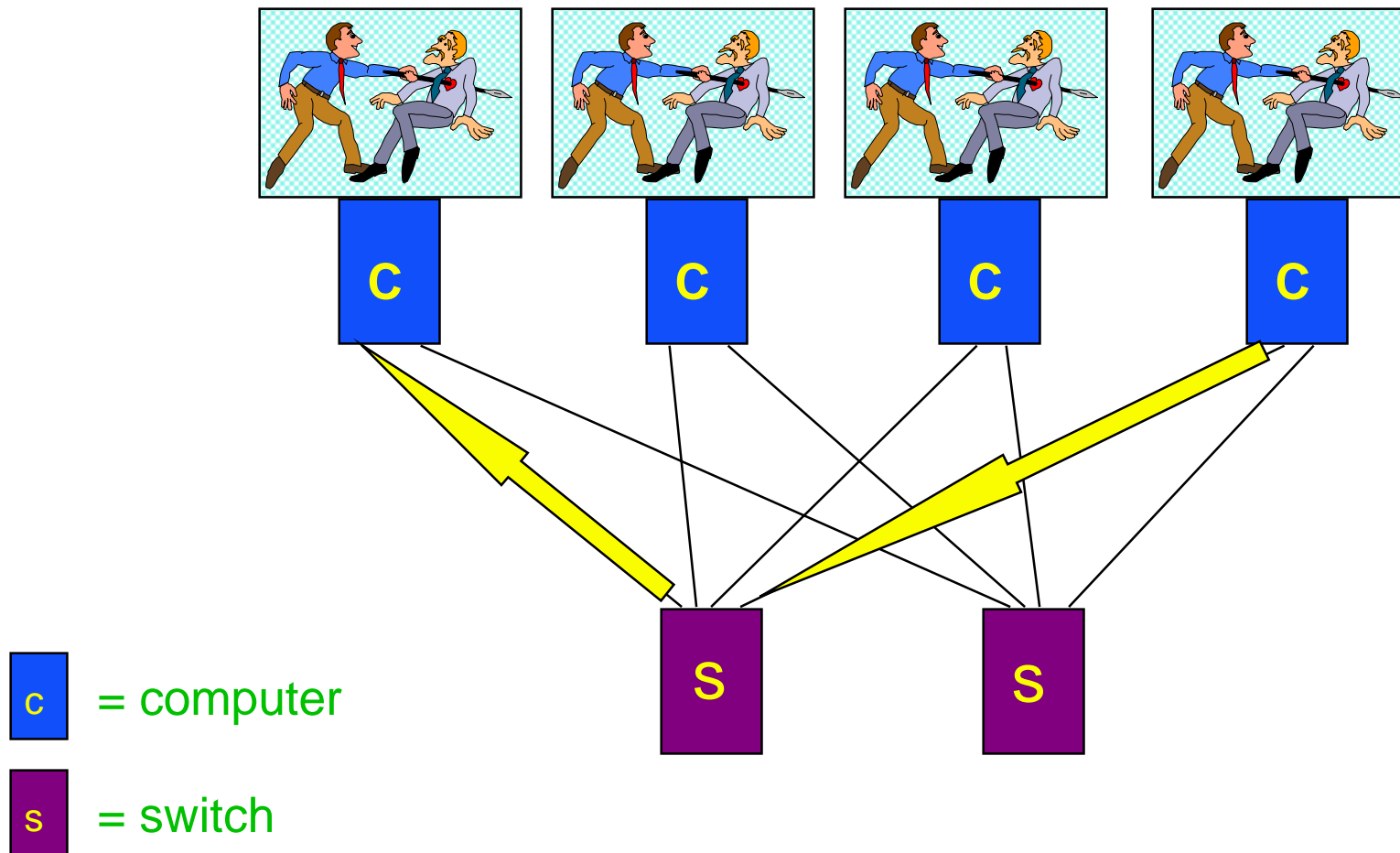
Reconstruction

$$b = c + b+c$$

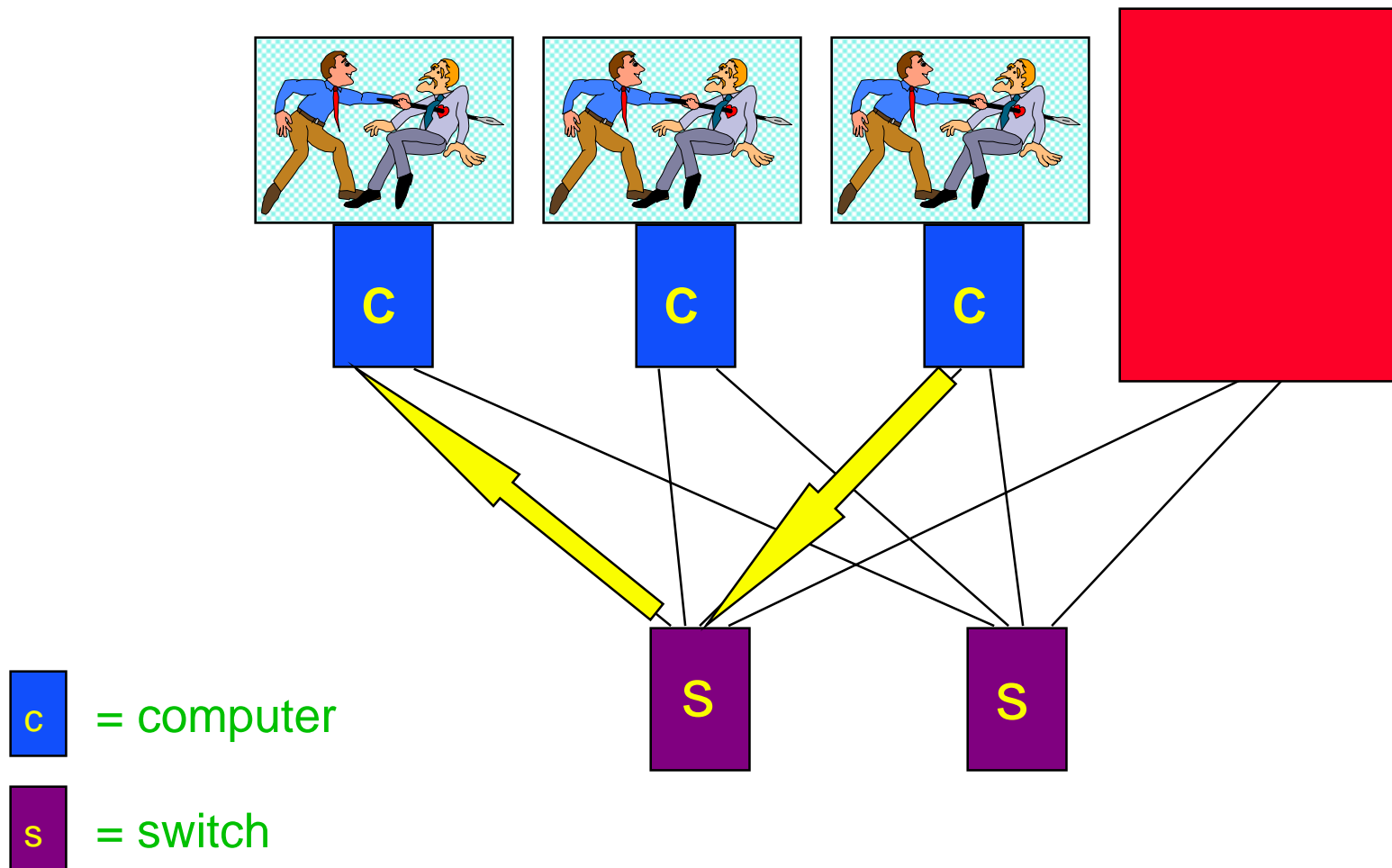
$$a = b + a+b$$



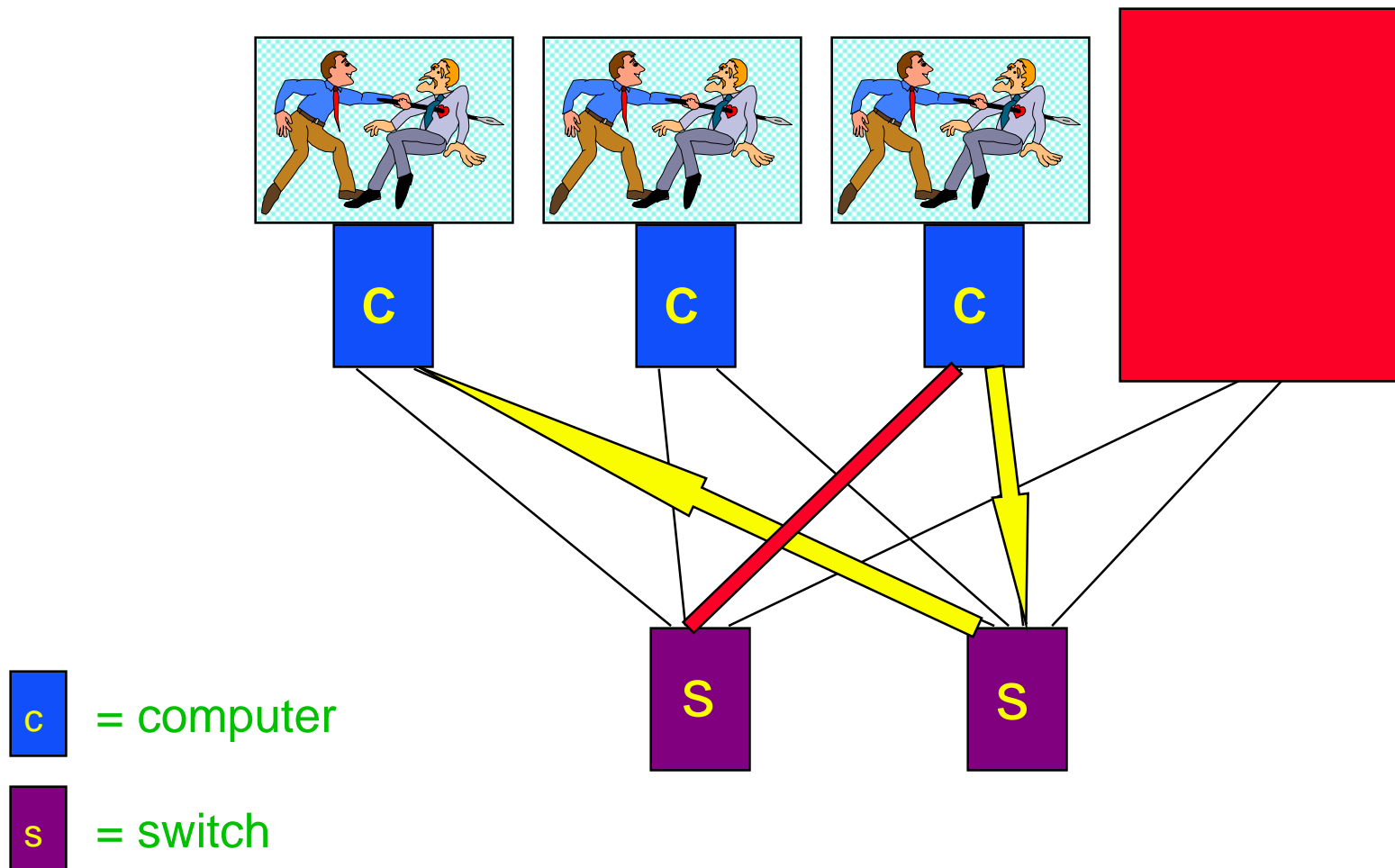
Finding a Mate



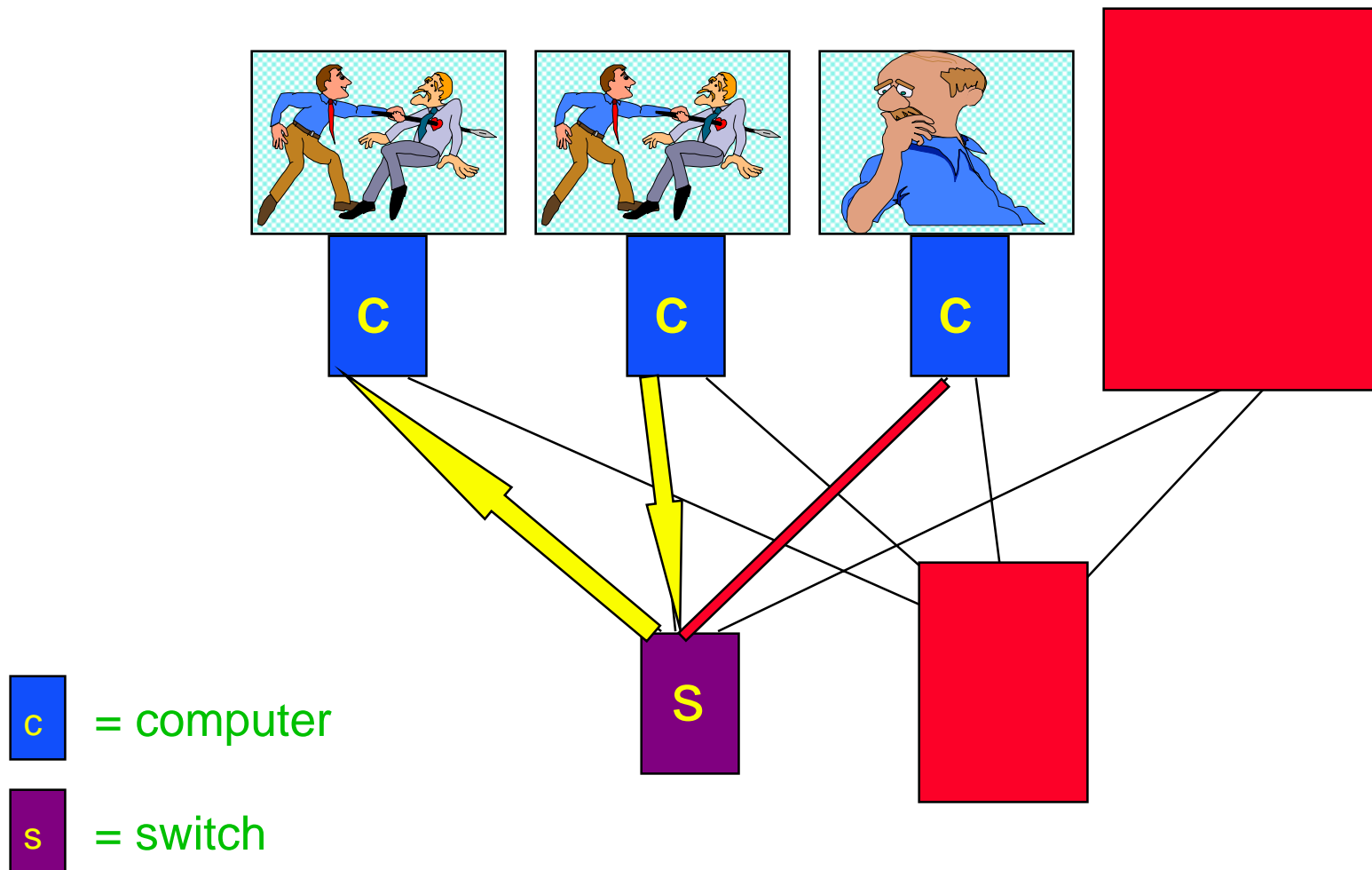
Computing Node Faults



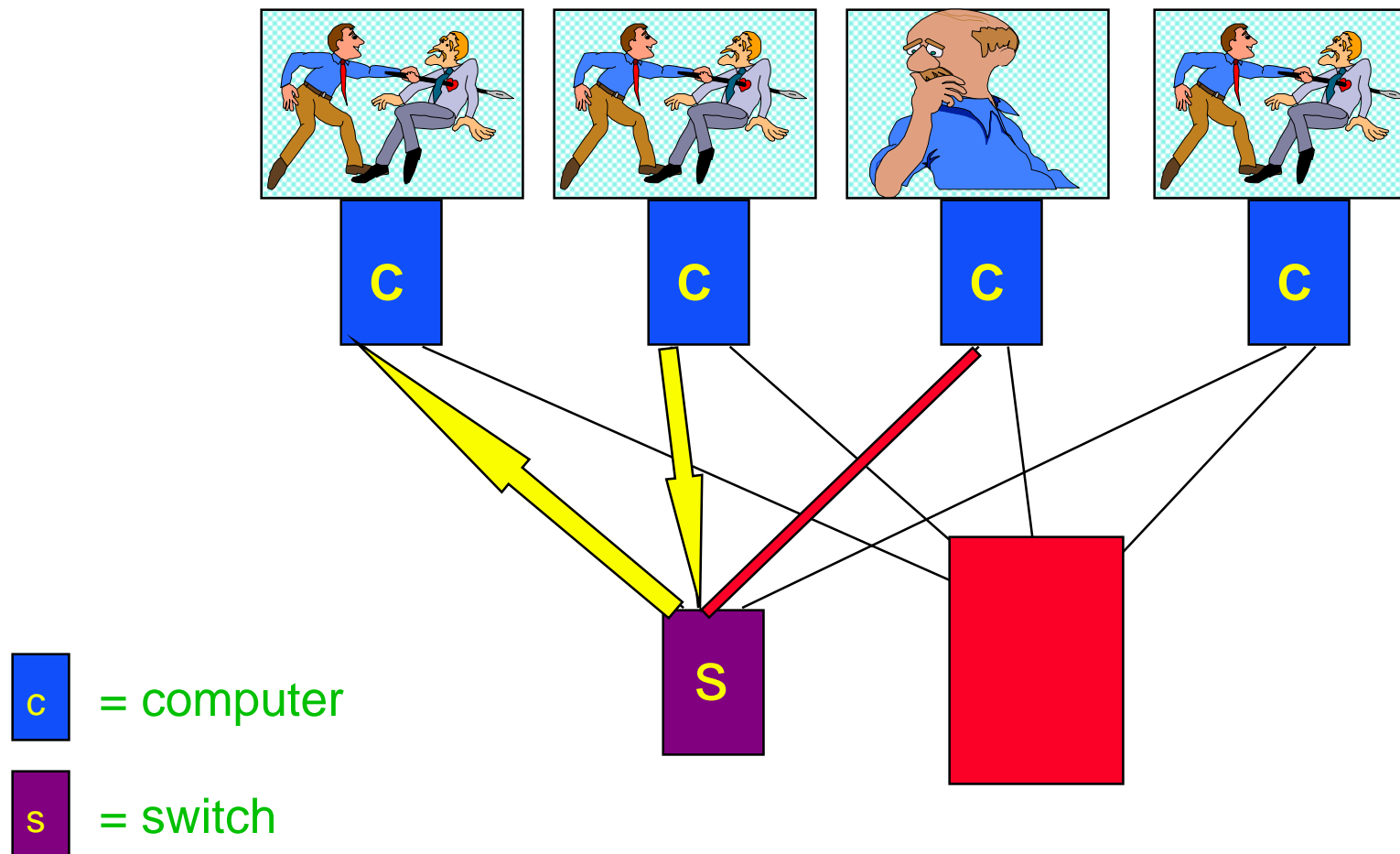
Link Faults



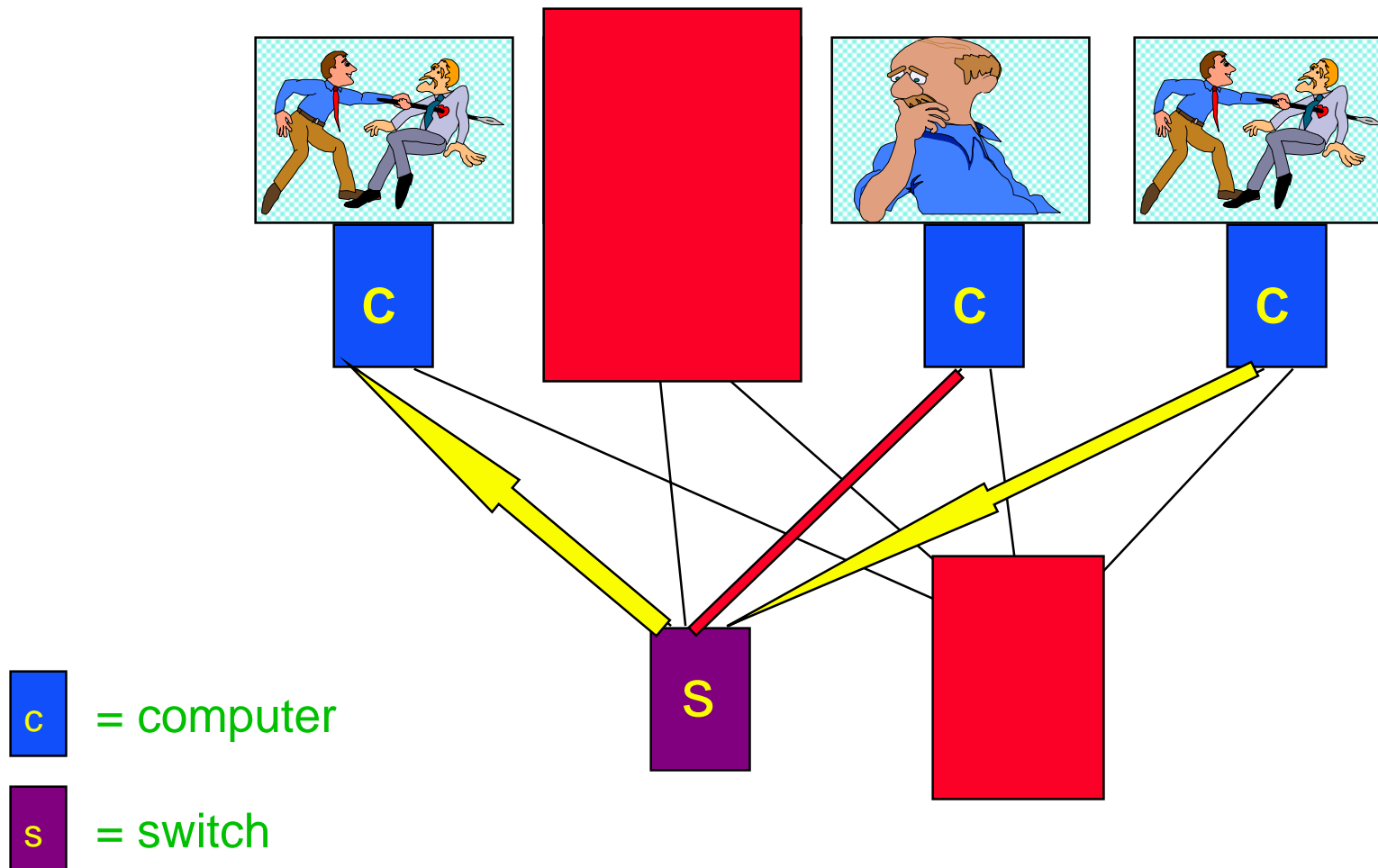
Switch Faults



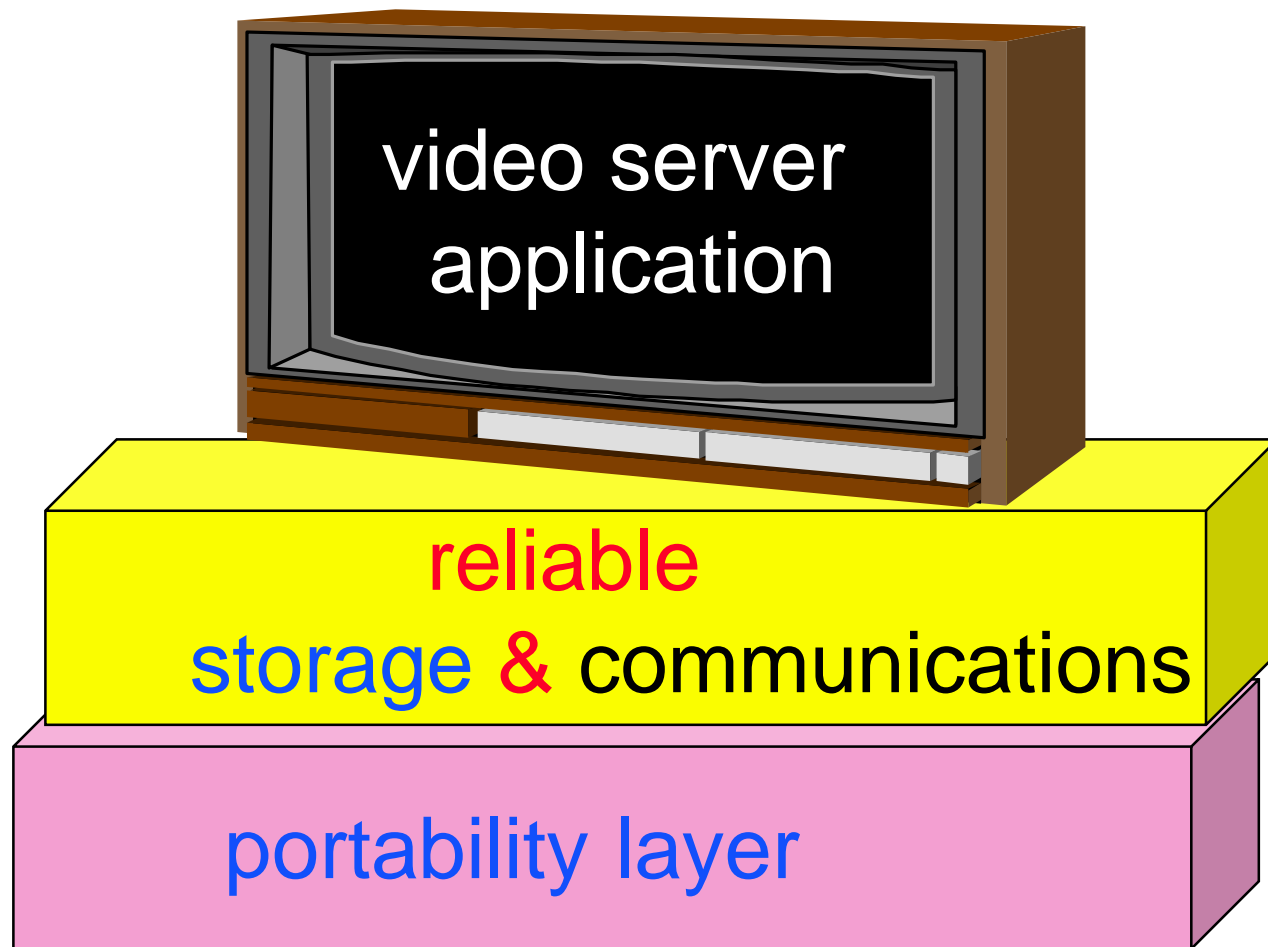
Getting Well



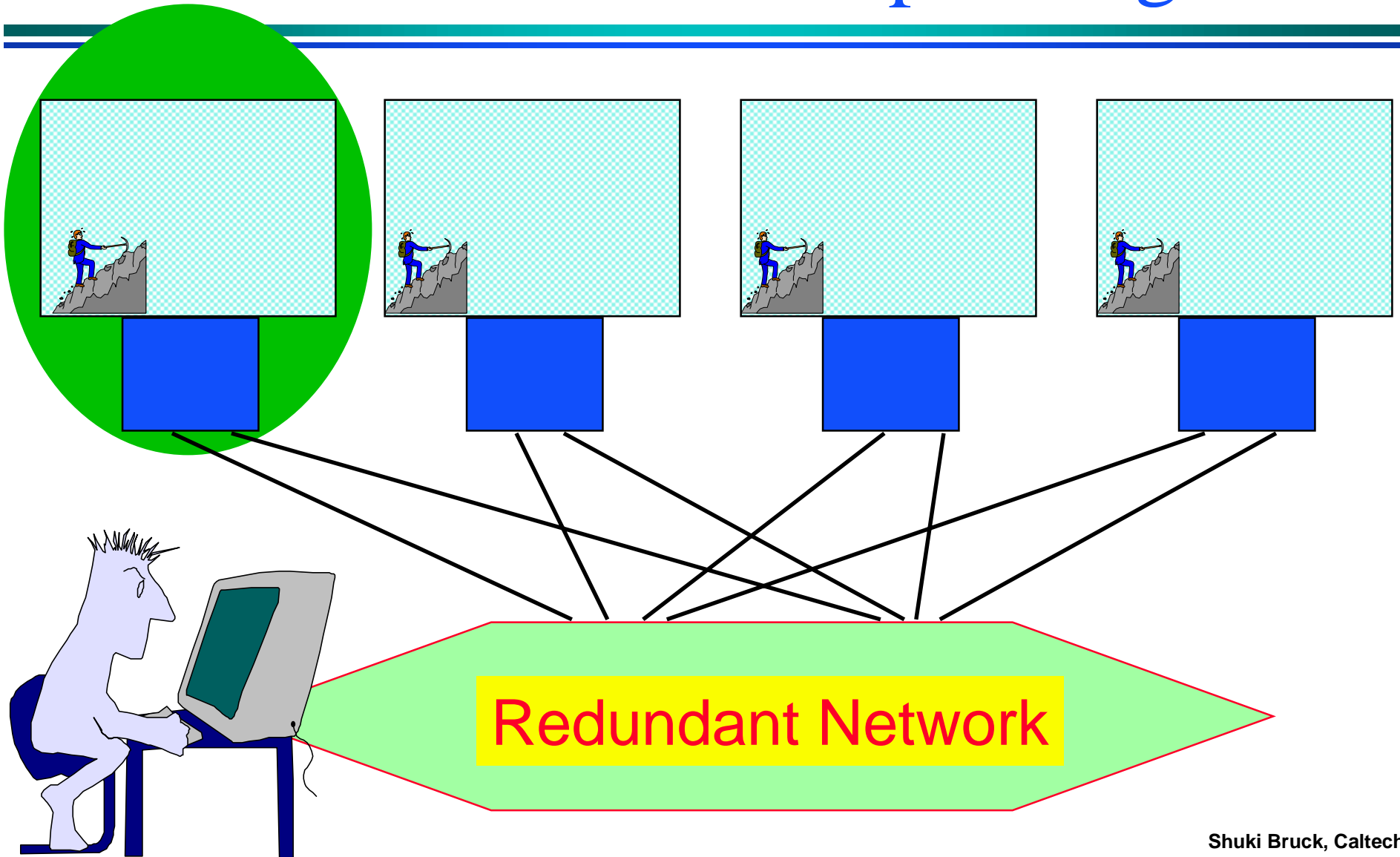
Continuous Reconfiguration



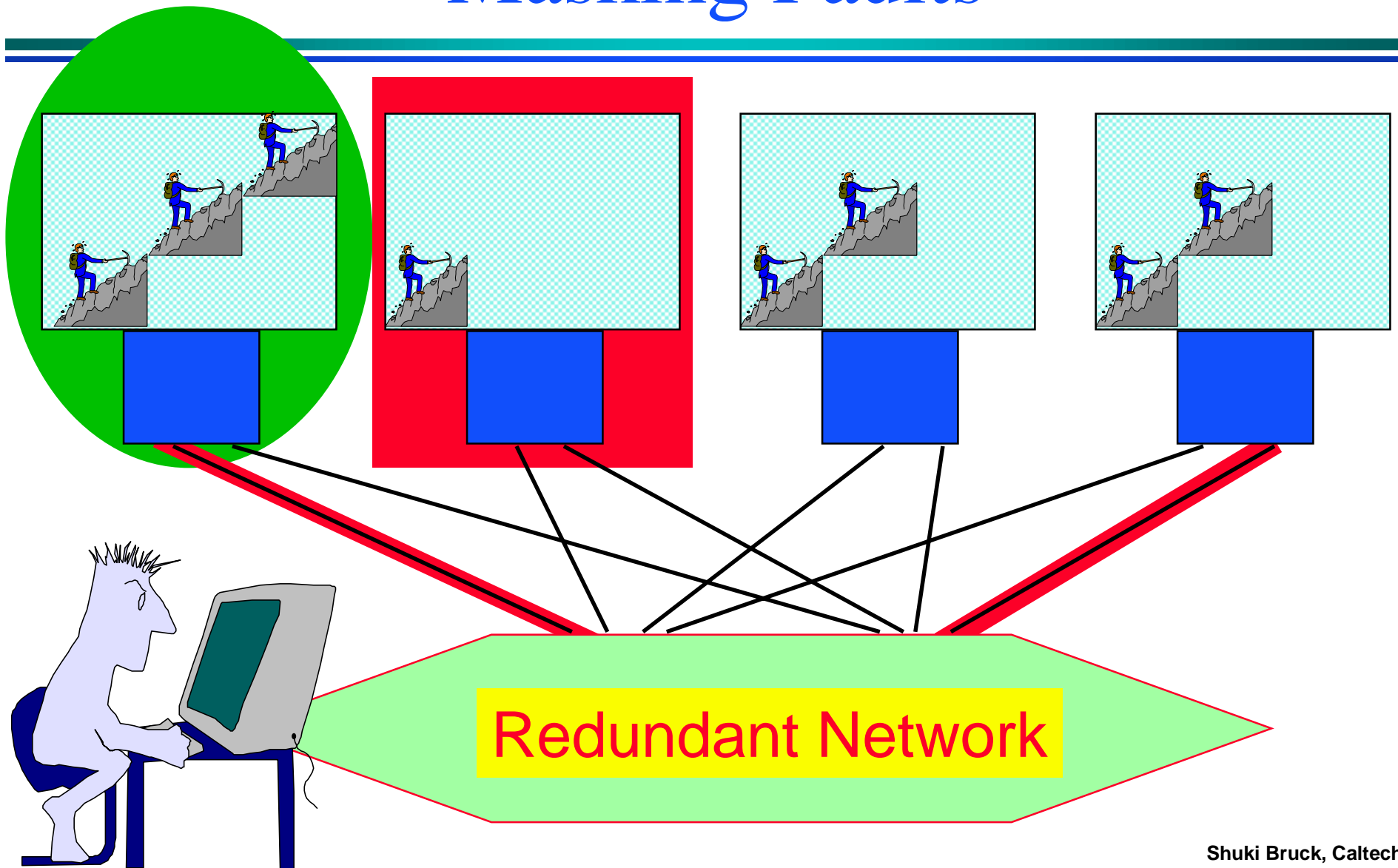
Building Blocks in RAIN 1.0



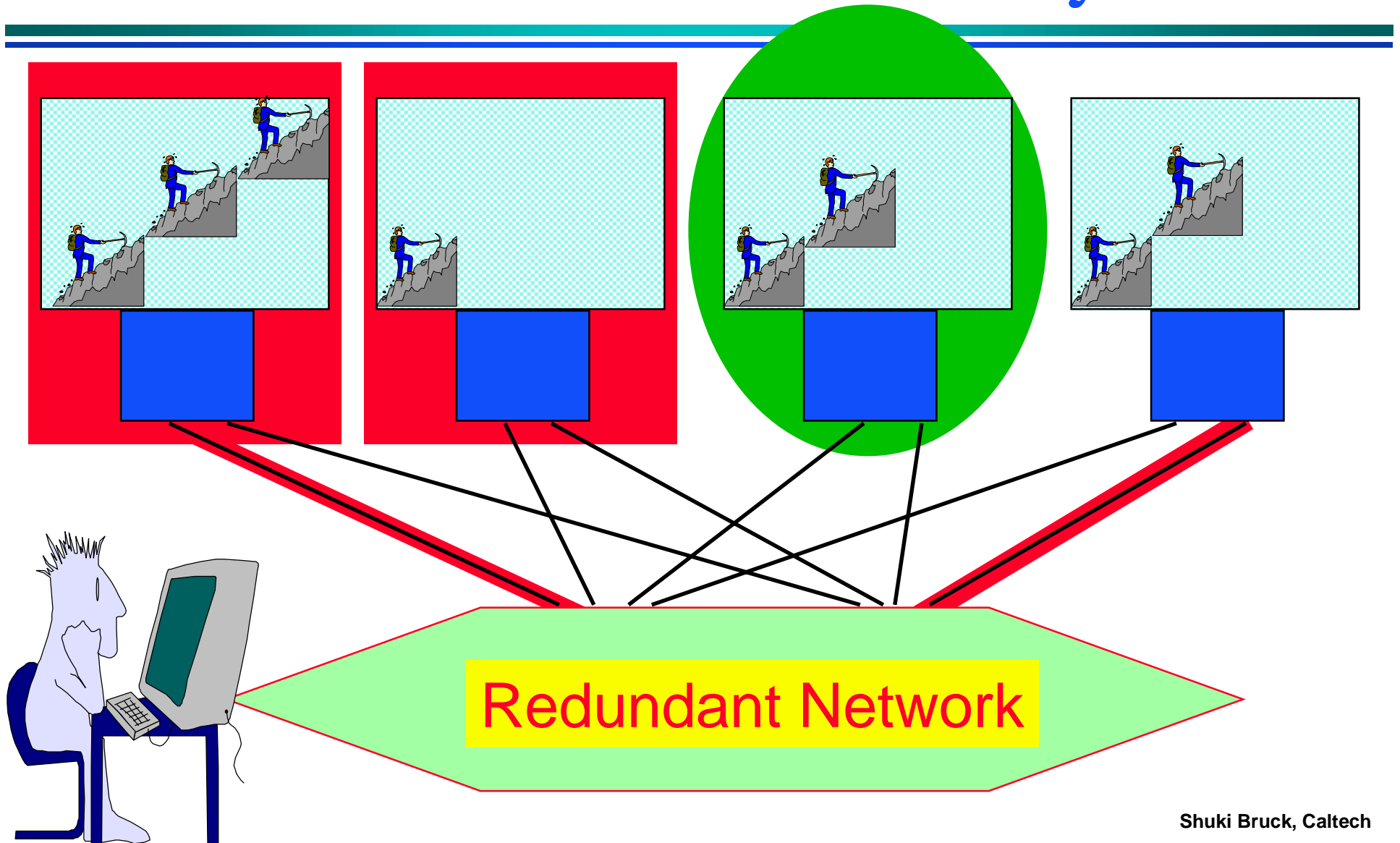
Distributed Checkpointing



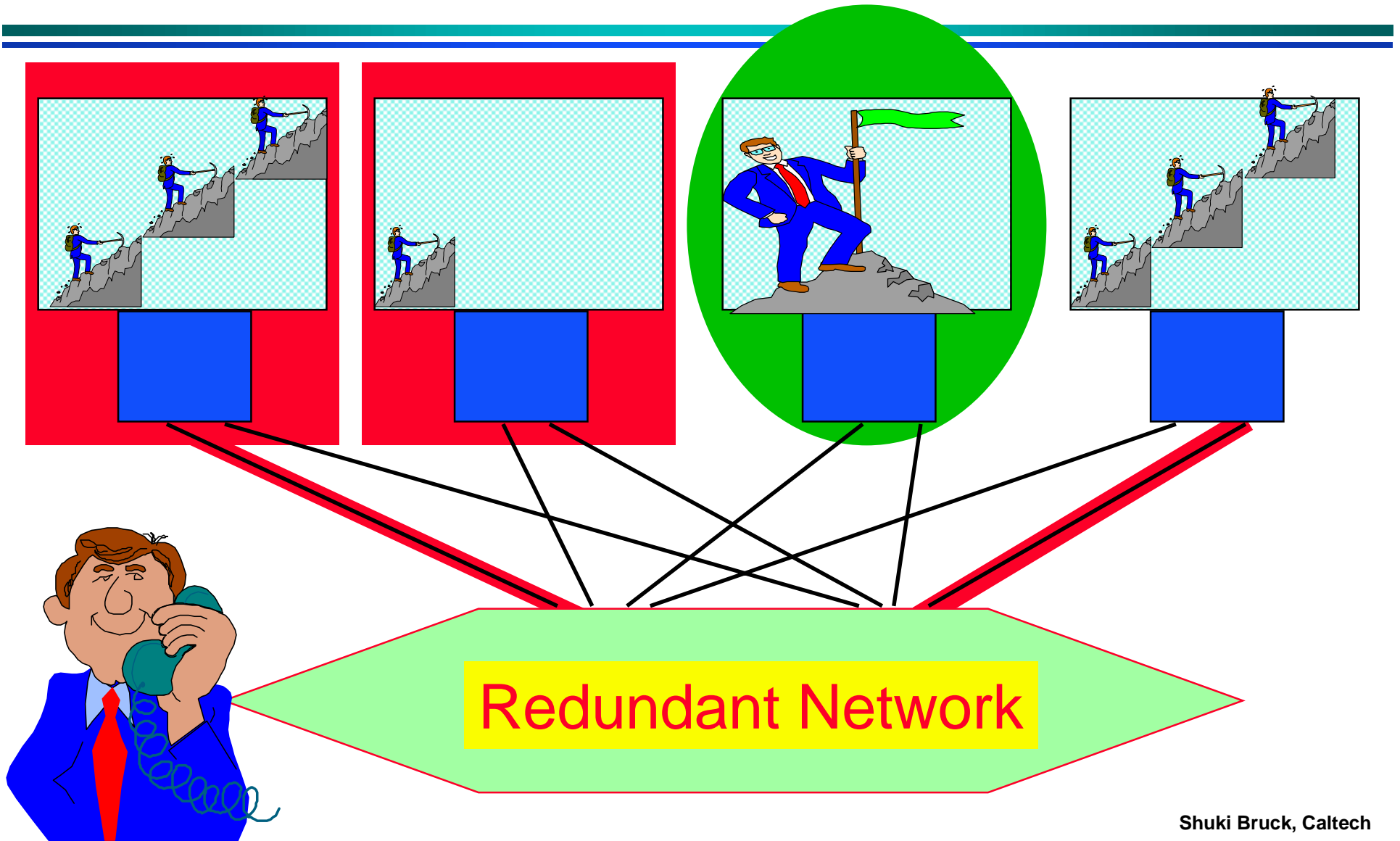
Masking Faults



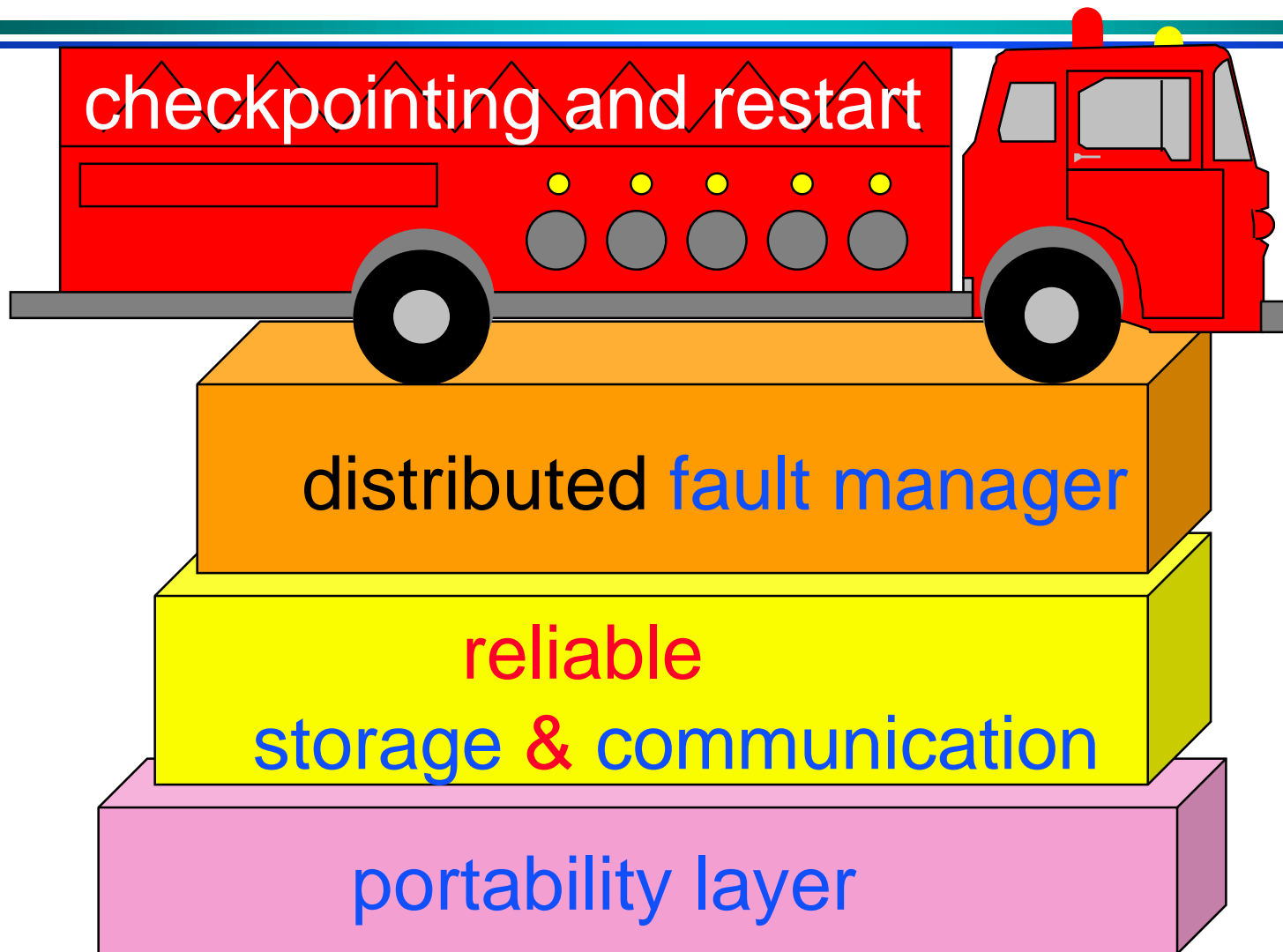
Fault Detection Rollback and Recovery



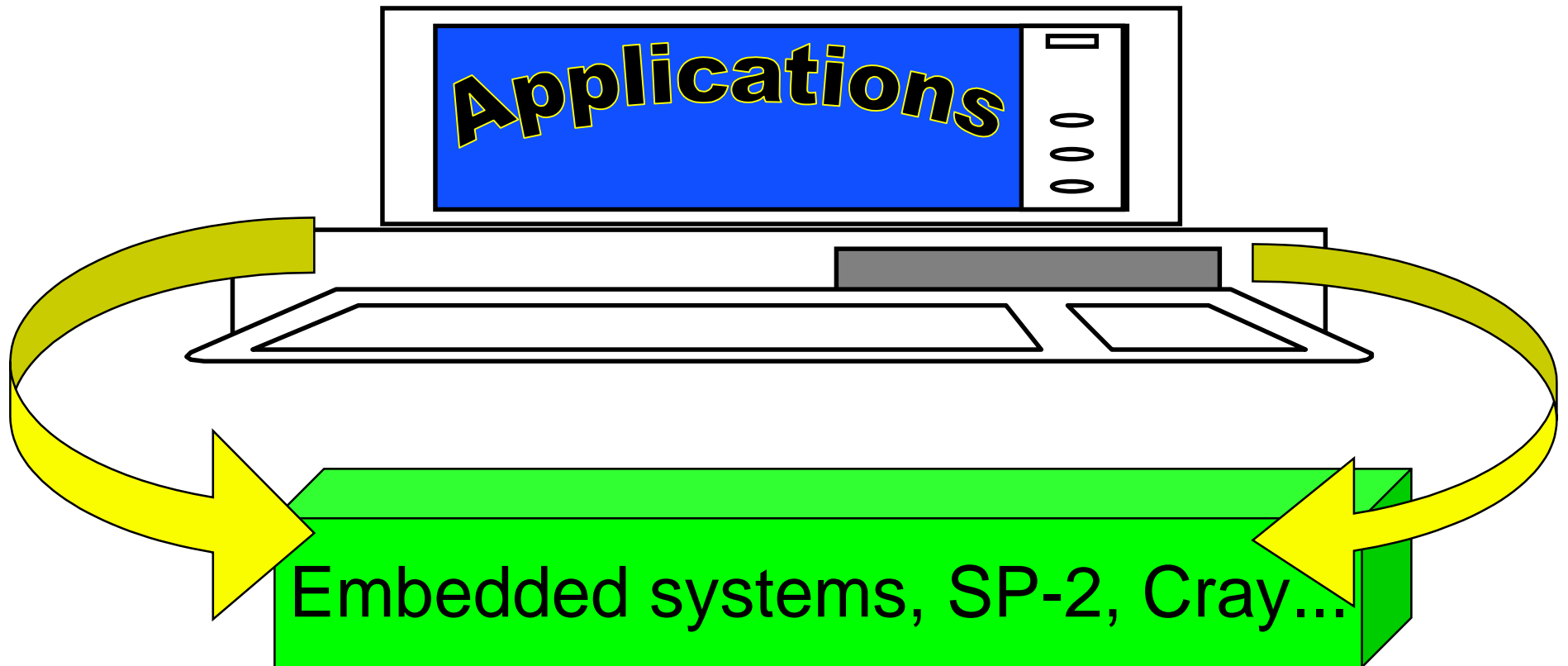
Successful Completion



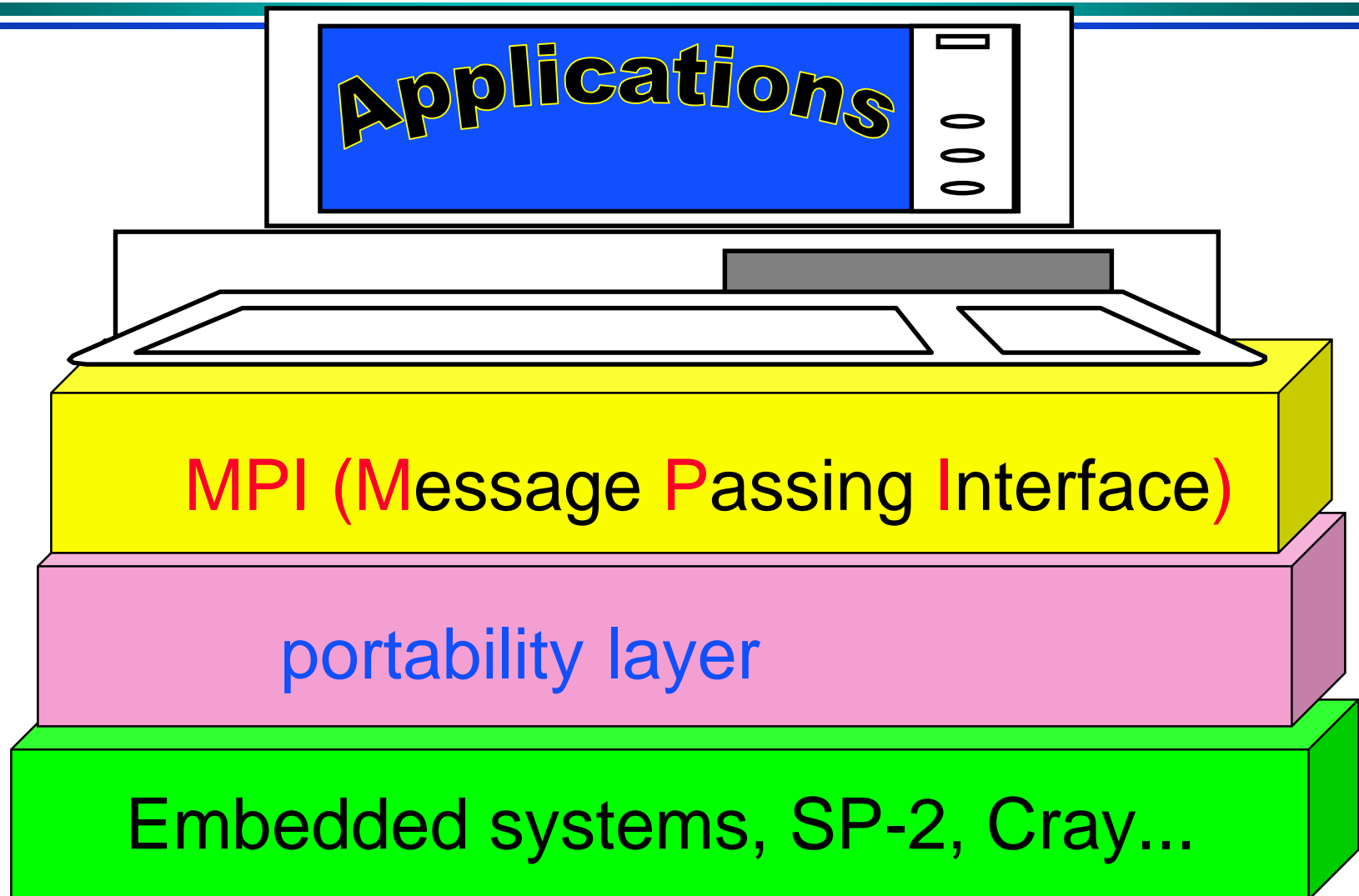
Building Blocks in CPT 1.0



Standard API

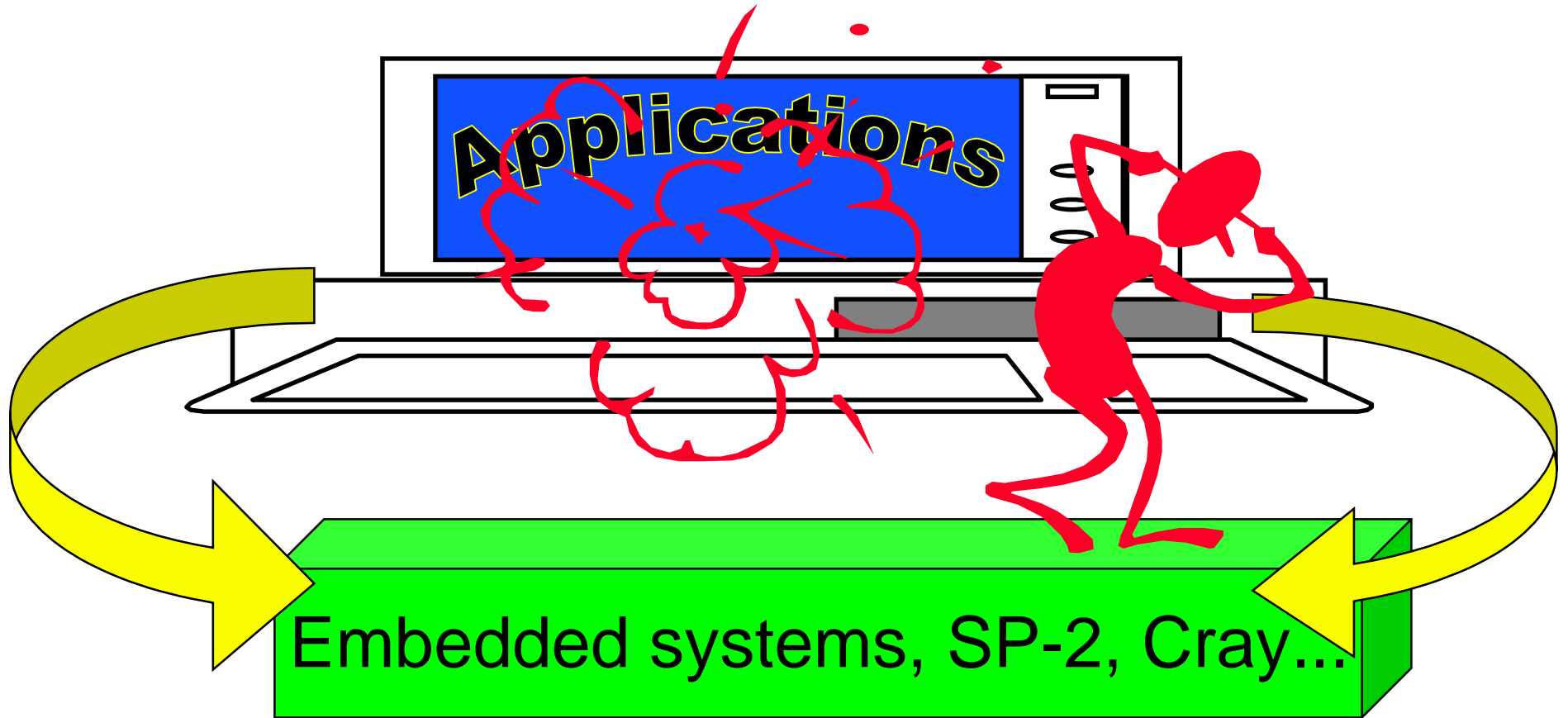


Parallel Programming API

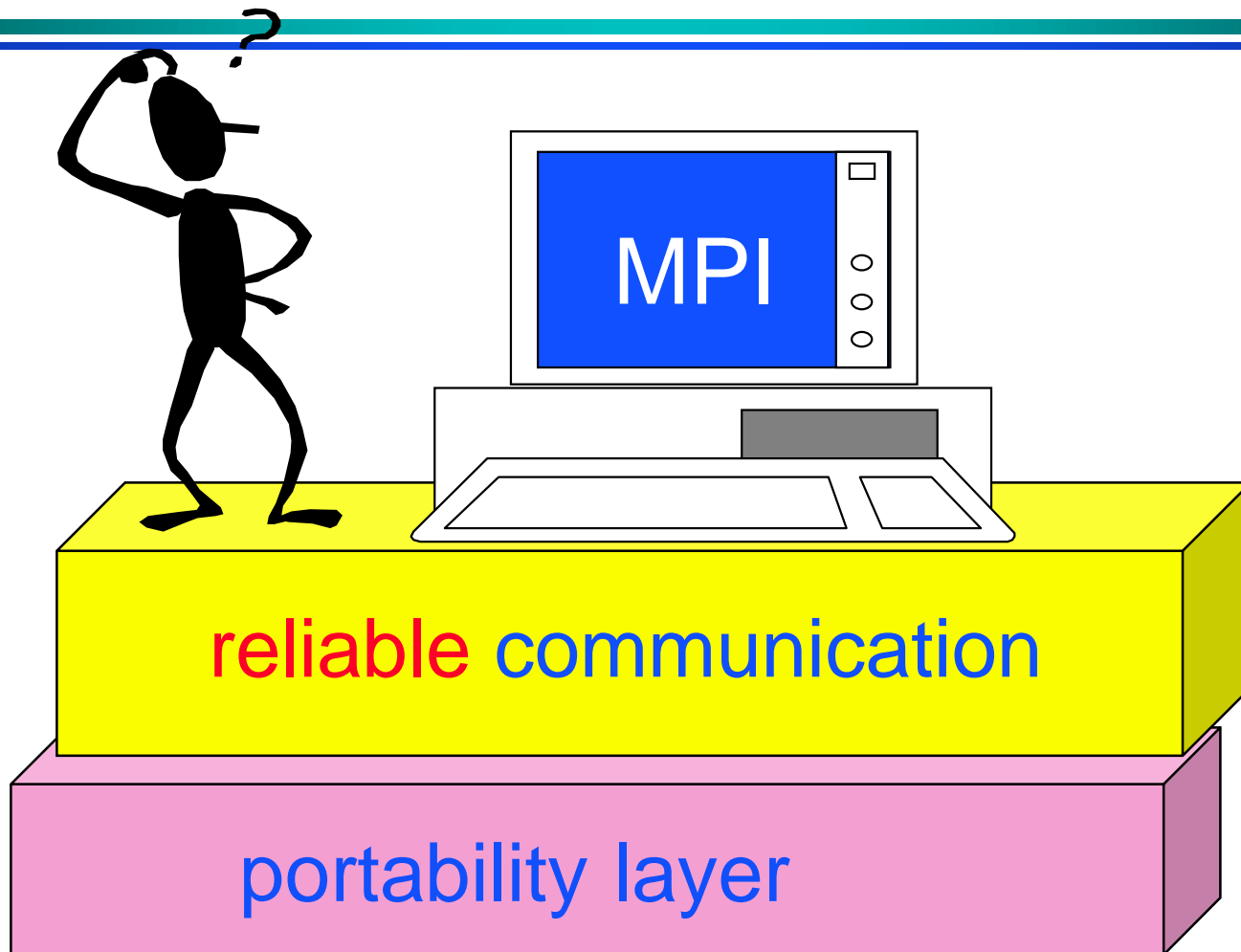


Standard API

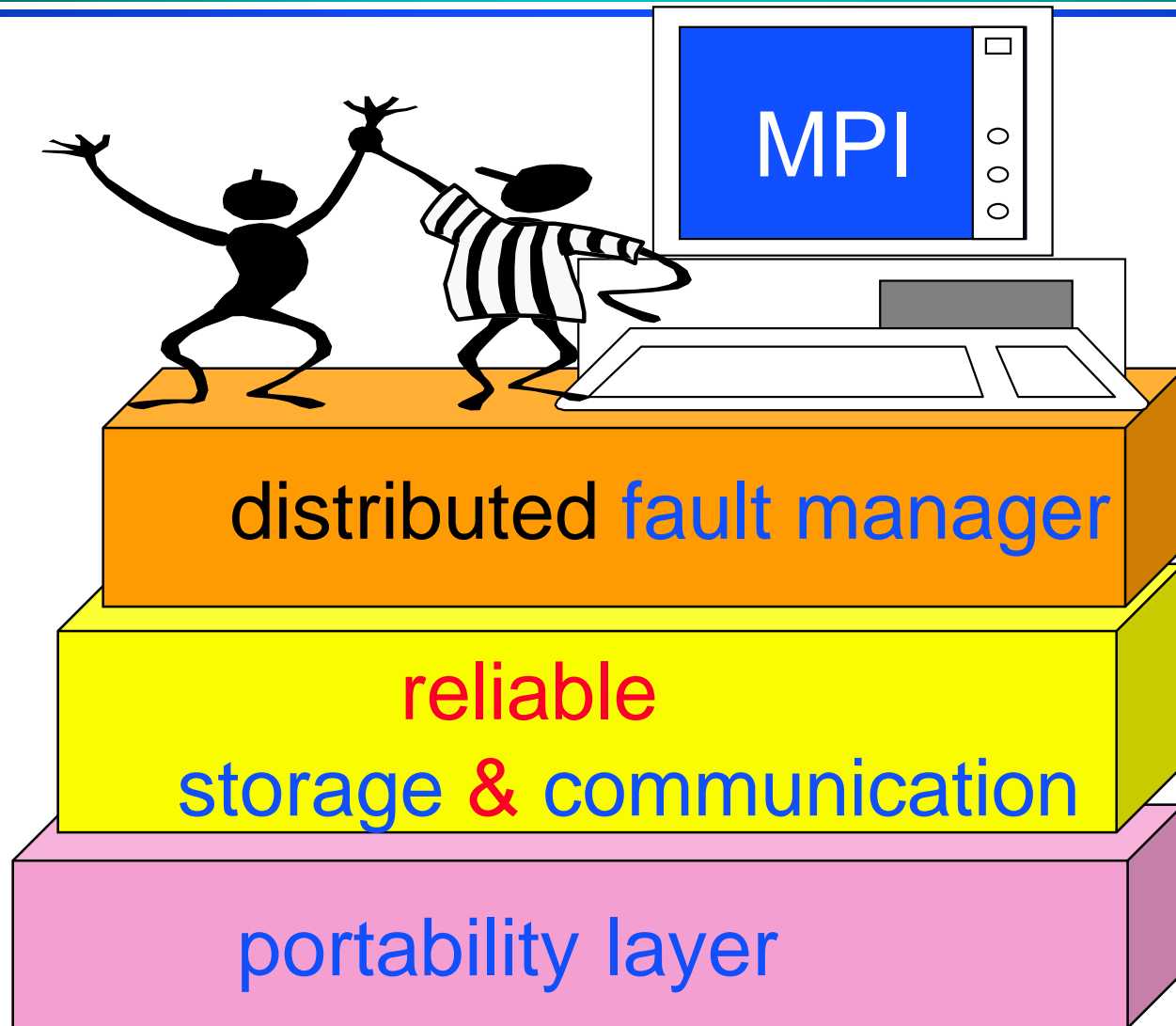
Transparent Fault Tolerance



Current Goal



Long Term Goal



Status and Current Activities

